

APPENDIX A

GEOTECHNICAL TECHNICAL AND MANAGERIAL TASK INVENTORY

This appendix contains a listing of the technical tasks performed by geotechnical engineers from the entry levels (GS-05/07/09) through the Technical Expert (GS-15). Managerial, technical and advisory tasks for the Technical Manager (GM-13/14 and GM-15) are also included. The geotechnical engineer should make a concentrated effort to develop the skills and knowledge at each grade level to ensure that he or she obtains an adequate depth of experience during career development.

GS-0810-05/07/09 Geotechnical Engineer

PLANNING GEOTECHNICAL PROJECTS

1. Assist in the collection of regional and project site-specific data.
2. Assist in the performance of site reconnaissance.
3. Assist in the development of quantity estimates for investigations and design for feasibility studies.
4. Assist in the preparation of engineering documentation.
5. Assist in preparation for briefings and meetings.

DESIGNING & ANALYZING GEOTECHNICAL PROJECTS

6. Collect data for developing detailed scope of work.
7. Participate in conducting portions of special purpose geotechnical and materials investigations.
8. Assist in the preparation of testing instructions and tabulating results for evaluation.
9. Perform calculations and portions of detailed analyses for geotechnical aspects of the project design.
10. Calculate quantities for materials distribution plans
11. Prepare portions of contract documents.
12. Prepare CADD drawings.
13. Use engineering software application packages.

CONSTRUCTING GEOTECHNICAL PROJECTS/ASPECTS OF PROJECTS

14. Collect information and data from field sites for design verification.
15. Reduce and plot data for design verification.
16. Assist in the collection and interpretation of construction control data.
17. Assist in the preparation of geotechnical aspects of post construction reports.
18. Monitor/inspect installation of field instruments.
19. Collect/monitor instrumentation data.

OPERATING AND MAINTAINING GEOTECHNICAL ASPECTS OF PROJECTS

20. Assist with geotechnical assistance to operations and maintenance staff.
21. Provide geotechnical assistance to operations and maintenance staff.
22. Perform initial evaluation of data collected from engineering devices at projects.
23. Perform inspections and performance evaluations of geotechnical components of projects.
24. Make recommendations for additional investigations or remedial actions based on results of inspections and evaluations.
25. Assist in response to emergencies such as floods, earthquakes, and hurricanes as geotechnical member of emergency response team.

RESEARCHING AND DEVELOPING GEOTECHNICAL APPLICATIONS

26. Assist in special purpose geotechnical and material investigations by performing limited portions of investigations under the supervision of senior engineer.
27. Assist in performance of special purpose geotechnical tests.
28. Monitor/collect data from special purpose geotechnical tests.
29. Conduct analysis of test results and investigation findings under guidance of senior engineer.
30. Conduct literature review to determine research precedents and state of art in area of research.

GS-0810-11 Geotechnical Engineer

PLANNING GEOTECHNICAL PROJECTS

31. Research/collect existing regional and site-specific data.
32. Perform site reconnaissance.
33. Assist in site reconnaissance.
34. Assist in determination of scope of investigation and design Initial Project Management Plan (IPMP).
35. Initiate site-specific field investigation program.
36. Perform determination of geotechnical aspects for feasibility.
37. Assist in determination of geotechnical aspects for feasibility.
38. Assist in performing geotechnical evaluations for benefit determination.
39. Assist in performing risk analysis.
40. Assist in formulation of conceptual design.
41. Prepare geotechnical aspects of engineering documentation.
42. Prepare materials/briefings for public meetings.
43. Assist in public meetings.

DESIGNING/ANALYZING GEOTECHNICAL PROJECTS

44. Provide input for/prepare detailed scope of geotechnical work.
45. Assist with special purpose geotechnical and materials investigations such as excavation unwatering study, landslide analysis, seismic evaluations, dam safety re-evaluations and modifications, reservoir rim evaluations, ground water modeling.
46. Develop and conduct detailed field investigations.
47. Select laboratory testing program.
48. Assign laboratory testing program.
49. Evaluate laboratory testing program.
50. Assist in the design of foundations and excavations, including dredging and disposal areas.
51. Design foundations and excavations, including dredging and disposal areas.
52. Assist in the design of earth and rock embankments.
53. Assist in the design of tunnels and underground openings.
54. Design pavements, roadways, airfields, etc.
55. Design less complex containment systems (HTRW), i.e., landfill caps, pond liners, etc.
56. Assist in the design of instrumentation systems.
57. Design less complex instrumentation systems.
58. Design slope protection.
59. Design channel stabilization.

- 60. Participate in the design of shore line protection.
- 61. Assist in the preparation of material usage, excavation and construction sequence, and quantity estimates.
- 62. Evaluate materials for construction.
- 63. Assist in preparation of engineering considerations for construction personnel.
- 64. Assist in the preparation of construction contracting documents.
- 65. Assist in the preparation of concrete mix and shotcrete design.
- 66. Assist in remedial design and repair of concrete structures.

CONSTRUCTING GEOTECHNICAL PROJECTS/ASPECTS OF PROJECTS

- 67. Provide geotechnical assistance to project construction staff.
- 68. Conduct site visit for design verification.
- 69. Provide technical assistance for contract modifications.
- 70. Collect design/construction control data.
- 71. Interpret design/construction control data.
- 72. Investigate construction site conditions for foundation treatment and fill/concrete placement.
- 73. Prepare post-construction reports.
- 74. Review and provide technical input for as-builts.
- 75. Inspect foundation excavation and treatments.
- 76. Control embankment placement.

OPERATING AND MAINTAINING GEOTECHNICAL ASPECTS OF PROJECTS

- 77. Provide geotechnical assistance to operations and maintenance staff.
- 78. Inspect performance of project components.
- 79. Evaluate performance of project components.
- 80. Monitor instrumentation data for project performance.
- 81. Evaluate instrumentation data for project performance.
- 82. Recommend modifications for identified project deficiencies.
- 83. Verify dredging condition surveys.
- 84. Provide geotechnical assistance for emergency operations.
- 85. Respond to emergencies (natural disasters such as flood fighting, hurricanes, earthquakes).
- 86. Assist in instructing project personnel in formal dam safety training.

RESEARCHING AND DEVELOPING GEOTECHNICAL APPLICATIONS

- 87. Assist in conduct of special purpose geotechnical and materials investigations.
- 88. Assist in conducting special purpose geotechnical tests.

- 89. Prepare portions of technical guidelines, design guidance, and reports.
- 90. Review state-of-the-art practices and procedures for Corps applications.

GS-0810-12 Geotechnical Engineer

PLANNING GEOTECHNICAL PROJECTS

- 91. Formulate conclusions and recommendations based on personal or subordinates' research and collection of existing data.
- 92. Perform site reconnaissance.
- 93. Provide geotechnical recommendation for site selection.
- 94. Determine scope of investigation and design (IPMP).
- 95. Initiate site-specific field investigation program.
- 96. Determine geotechnical aspects for feasibility.
- 97. Perform geotechnical evaluations for benefits determination.
- 98. Perform risk analysis.
- 99. Formulate conceptual design.
- 100. Prepare geotechnical aspects of engineering documentation.
- 101. Assure technical review is scheduled.
- 102. Prepare materials/briefings for public meetings.
- 103. Brief public.

DESIGNING & ANALYZING GEOTECHNICAL PROJECTS

- 104. Prepare detailed scope of geotechnical work.
- 105. Conduct special purpose geotechnical and materials investigations such as excavation unwatering study, landslide analysis, seismic evaluations, dam safety re-evaluations and modifications, reservoir rim evaluations, ground water modeling.
- 106. Develop detailed field investigations.
- 107. Direct detailed field investigations.
- 108. Develop design for soil/structure interaction.
- 109. Select, assign, and evaluate laboratory testing program.
- 110. Select design parameters.
- 111. Design foundations and excavations, including dredging and disposal areas.
- 112. Design earth and rock embankments.
- 113. Design tunnels and underground openings.
- 114. Design pavements, roadways, airfields, etc.
- 115. Design containment systems (HTRW).
- 116. Design instrumentation systems.
- 117. Design slope protection.

- 118. Design channel stabilization.
- 119. Design shore line protection.
- 120. Prepare material usage, excavation and construction sequence, and quantity estimates.
- 121. Evaluate materials for construction.
- 122. Prepare engineering considerations for construction personnel.
- 123. Prepare construction contracting documents.
- 124. Prepare concrete mix and shotcrete design.
- 125. Perform remedial design and repair of concrete structures.
- 126. Perform technical review.
- 127. Analyze/interpret performance of structures and foundations (forensic).

CONSTRUCTING GEOTECHNICAL ASPECTS OF PROJECTS

- 128. Execute responsibilities of embankment engineer.
- 129. Provide geotechnical assistance to project construction staff.
- 130. Conduct site visit for design verification.
- 131. Provide technical assistance for contract modifications.
- 132. Collect design/construction control data.
- 133. Interpret design/construction control data.
- 134. Direct/advise resident engineer on foundation conditions, treatment, and fill/concrete placement.
- 135. Prepare post-construction reports.
- 136. Review technical input for as-builts.
- 137. Provide technical input for as-builts.

OPERATING & MAINTAINING GEOTECHNICAL ASPECTS OF PROJECTS

- 138. Provide geotechnical advice/assistance to operations and maintenance staff.
- 139. Evaluate project performance based on inspection and instrumentation data.
- 140. Commend modifications for identified project deficiencies
- 141. Verify dredging condition surveys
- 142. Provide geotechnical advice/assistance for emergency operations.
- 143. Respond to emergencies (natural disasters such as flood fighting, hurricanes, earthquakes).
- 144. Assure technical review is scheduled and performed.
- 145. Instruct project personnel in formal dam safety training.
- 146. Accept foundation excavations and treatments.

RESEARCHING AND DEVELOPING GEOTECHNICAL APPLICATIONS

- 147. Conduct special purpose geotechnical and materials investigations.
- 148. Conduct special purpose geotechnical tests.
- 149. Prepare technical guidelines, design guidance, and reports.
- 150. Study/evaluate state of the art practices and procedures for Corps applications.

ENSURING IMPLEMENTATION OF STATE-OF-THE-ART TECHNOLOGY

- 151. Serve on regional boards, as officer in professional organizations, or USACE task groups.

GS-0810-13/14 TECHNICAL EXPERT

PLANNING GEOTECHNICAL PROJECTS

- 152. Review geotechnical recommendation for site selection.
- 153. Coordinate geotechnical recommendation for site selection.
- 154. Review scope of investigation and design (IPMP).
- 155. Coordinate scope of investigation and design (IPMP).
- 156. Review geotechnical aspects for project formulation.
- 157. Coordinate geotechnical aspects for project formulation.
- 158. Review conceptual design.
- 159. Coordinate conceptual design.
- 160. Review geotechnical aspects of engineering documentation.
- 161. Coordinate geotechnical aspects of engineering documentation.
- 162. Represent agency at public meetings.
- 163. Represent agency regionally as a technical expert.
- 164. Develop policy, technical criteria and standards for geotechnical input to project formulation.
- 165. Ensure compliance with policy, technical criteria and standards for geotechnical input to project formulation through quality assurance process.
- 166. Perform technical Review (independently).
- 167. Lead Technical review (independently).
- 168. Assure Technical review is scheduled/performed.

DESIGNING & ANALYZING GEOTECHNICAL PROJECTS

- 169. Prepare detailed scope of geotechnical work.

170. Conduct special purpose geotechnical and materials investigations such as excavation unwatering study, landslide analysis, seismic evaluations, reservoir rim evaluations, ground water modeling.
171. Develop detailed field investigations.
172. Direct detailed field investigations.
173. Review detailed field investigations.
174. Develop design for soil/structure interaction.
175. Review design for soil/structure interaction.
176. Select laboratory testing program.
177. Assign laboratory testing program.
178. Evaluate laboratory testing program.
179. Review laboratory testing program.
180. Select design parameters.
181. Review design parameters.
182. Design foundations and excavations, including dredging and disposal areas.
183. Review foundations and excavations designs, including dredging and disposal areas.
184. Design earth and rock embankments.
185. Review earth and rock embankment designs.
186. Design tunnels and underground openings.
187. Review tunnel and underground opening designs.
188. Design pavements, roadways, airfields, etc.
189. Review pavement, roadway, airfield, etc., designs.
190. Design containment systems (HTRW).
191. Review containment systems (HTRW) designs.
192. Design instrumentation systems.
193. Review instrumentation system designs.
194. Design slope protection.
195. Review slope protection designs.
196. Design channel stabilization.
197. Review channel stabilization designs.
198. Design shore line protection.
199. Review shore line protection designs.
200. Prepare material usage, excavation and construction sequence, and quantity estimates.
201. Review material usage, excavation and construction sequence, and quantity estimates.
202. Evaluate materials for construction.
203. Review materials for construction.
204. Prepare engineering considerations for construction personnel.
205. Review engineering considerations for construction personnel.
206. Prepare construction contracting documents.

- 207. Review construction contracting documents.
- 208. Prepare concrete mix and shotcrete design.
- 209. Perform remedial design and repair of concrete structures.
- 210. Review remedial design and repair of concrete structures.
- 211. Perform Technical review (independently).
- 212. Lead Technical review (independently).
- 213. Serve as regional technical resource.
- 214. Serve as technical resource to advise Chief, Engineering Division.

CONSTRUCTING GEOTECHNICAL ASPECTS OF PROJECTS

- 215. Provide geotechnical assistance to project construction staff.
- 216. Conduct site visit for design verification.
- 217. Provide technical assistance for contract modifications.
- 218. Collect design/construction control data.
- 219. Interpret design/construction control data.
- 220. Direct resident engineer on foundation conditions, treatment, and fill/concrete placement.
- 221. Advise resident engineer on foundation conditions, treatment, and fill/concrete placement.
- 222. Prepare post-construction reports.
- 223. Review technical direction for as-builts.
- 224. Provide technical direction for as-builts.
- 225. Serve as regional technical resource.
- 226. Provide technical expertise in construction claim cases.
- 227. Negotiate contract clauses, requirements, and disputes.

OPERATING AND MAINTAINING GEOTECHNICAL ASPECTS OF PROJECTS

- 228. Provide geotechnical advice/assistance to operations and maintenance staff.
- 229. Evaluate project performance based on inspection and instrumentation data.
- 230. Recommend modifications for identified project deficiencies.
- 231. Verify dredging condition surveys (nature of materials).
- 232. Provide geotechnical advice/assistance for emergency operations.
- 233. Respond to emergencies (natural disasters such as flood fighting, hurricanes, earthquakes).
- 234. Perform Technical review (independently).
- 235. Lead Technical review (independently).
- 236. Coordinate dam safety program.
- 237. Serve as regional technical resource.
- 238. Assure dam safety training is conducted.

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- 239. Plan dam safety exercises.
- 240. Develop dam safety exercises.

RESEARCHING AND DEVELOPING GEOTECHNICAL APPLICATIONS

- 241. Conduct special purpose geotechnical and materials investigations.
- 242. Conduct special purpose geotechnical tests.
- 243. Prepare technical guidelines, design guidance, and reports.
- 244. Study/evaluate state-of-the-art practices and procedures for Corps applications.
- 245. Serve as regional technical resource.

ENSURING IMPLEMENTATION OF STATE-OF-THE-ART TECHNOLOGY

- 246. Instruct in PROSPECT geotechnical short courses/seminars.
- 247. Serve on regional boards, as officer in professional organizations, or USACE task groups.

GS/GM-0810/1350-13/14 TECHNICAL MANAGER

PLANNING GEOTECHNICAL PROJECTS

- 248. Provide geotechnical resources to support the production of planning products.
- 249. Develop policy used to define the geotechnical portion of planning processes.
- 250. Review all geotechnical input to the planning process.
- 251. Represent agency at public meetings.
- 252. Represent agency regionally.
- 253. Perform technical review.
- 254. Lead technical review team.

DESIGNING/ANALYZING GEOTECHNICAL PROJECTS

- 255. Approve detailed statement of work and product requirement documents.
- 256. Provide required geotechnical resource management input to accomplish planning and engineering products and services.
- 257. Coordinate required geotechnical resource management input with other offices in order to accomplish planning and engineering products and services.
- 258. Supervise technical experts and provide technical supervision for planning and

engineering products and services.

- 259. Develop geotechnical policy and procedures.
- 260. Manage geotechnical related programs, i.e., dam safety, HTRW
- 261. Advise the Commander on geotechnical technical issues.
- 262. Perform technical review.
- 263. Lead technical review team.
- 264. Assure technical review process is accomplished.
- 265. Advise dam safety officer/committee on dam safety remedial designs and repairs.
- 266. Serve as technical resource in representing the agency regionally.
- 267. Assure cost-effective design, quality product and services, customer satisfaction.

OPERATING AND MAINTAINING GEOTECHNICAL ASPECTS OF PROJECTS

- 268. Provide geotechnical expertise/resources to support district O&M programs.
- 269. Provide geotechnical expertise/resources to support district construction programs.
- 270. Negotiate contract clauses, requirements, and disputes.

RESEARCHING AND DEVELOPING GEOTECHNICAL APPLICATIONS

- 271. Develop engineering and scientific R&D programs.
- 272. Supervise/manage engineering and scientific R&D programs.
- 273. Represent organization on national and international review and policy boards for technical specialities.
- 274. Provide technical expertise and information to respond to global disasters and other emergency situations.
- 275. Facilitate technology transfer from R&D projects to improve design/construct criteria and practices.

ENSURING IMPLEMENTATION OF STATE-OF-THE-ART TECHNOLOGY

- 276. Instruct in PROSPECT geotechnical short courses/seminars.
- 277. Serve on regional boards, as officer in professional organizations, or USACE task groups.

GS-0810-15 Technical Expert

DEVELOPMENT, REVIEW AND EVALUATION OF AGENCY TECHNICAL DEVELOPING CRITERIA AND STANDARDS

- 278. Develop the technical criteria and standards for application on civil works projects
- 279. Participates in interagency task groups for developing governmentwide criteria and standards

ESTABLISHING GEOTECHNICAL AND MATERIALS POLICY, PRACTICES AND PROCEDURES

- 280. Develop technical policy, practices and procedures for geotechnical engineering applications
- 281. Represents USACE on interagency task groups for development of government wide standards, practices and procedures

TRAINING, RESEARCH AND DEVELOPMENT AND TECHNOLOGY TRANSFER

- 282. Develops technical training for geotechnical engineering applications
- 283. Monitors and coordinates training and technology transfer

CONSULTATION AND REPRESENTATION

- 284. Provides technical consultation within USACE
- 285. Represents USACE on Federal and non-Federal committees and task groups

GM 0810/1350-15 Technical Manager

STAFF SUPERVISION AND OPERATIONAL CONTROL

- 286. Plans, sets priorities, schedules and supervises activities carried out by the branch
- 287. Provides advice, counsel and instructions on work and administrative matters accomplished in the branch
- 288. Responsible for identifying training needs of the technical staff
- 289. Provides technical support the Emergency Operations Center

290. Maintains property accountability

PLANNING, DEVELOPMENT, REVIEW AND EVALUATION OF AGENCY TECHNICAL CRITERIA AND STANDARDS

291. Supervises the development of USACE technical criteria and standards for implementation in the planning, design, construction, operation, evaluation and modification of civil works projects.

292. Represents USACE on national and international committees and working groups that are developing technical guidelines, criteria and standards.

ESTABLISHING GEOTECHNICAL AND MATERIALS POLICY, PRACTICES AND PROCEDURES

293. Supervises the development of USACE technical policy for implementation in the planning, design, construction, operation, evaluation and modification of civil works projects.

294. Supervises the development of technical practices and procedures for implementation in USACE

295. Plans and supervises policy compliance reviews

TRAINING, RESEARCH AND DEVELOPMENT AND TECHNOLOGY TRANSFER

296. Supervises and provides oversight for the development of technical training in geotechnical engineering, materials engineering and engineering geology.

297. Provides oversight for technical monitorship of the Civil Works Research and Development Program

CONSULTATION AND REPRESENTATION

298. Supervises the coordination and development of the geotechnical, materials and geology technology transfer plans.

299. Serves as the functional representative for Geotechnical Engineers, Materials Engineers and Engineering Geologists.

300. Represents USACE on Federal and non-Federal committees and working groups.

301. Provides technical consultation within USACE and to other Federal agencies, state and foreign governments.